CLAIMS:

1. A computed tomography method which comprises the steps of:

- generating, using a radiation source (S), a conical radiation beam (4) which traverses an examination zone (13) or an object present therein,
- generating a relative motion between the radiation source (S) on the one side and the examination zone (13) or the object on the other side, which relative motion comprises a rotation about an axis of rotation (14) and a displacement parallel to the axis of rotation (14) and is shaped as a helix (17),
- acquiring measuring values which are dependent on the intensity in the radiation beam on the other side of the examination zone by means of a detector unit (16) during the relative motions,
- reconstructing a CT image of the examination zone (13) from the measuring values, in which reconstruction an exact 3D back projection comprising the following steps is carried out:
- determining the partial derivative of measuring values of parallel rays with different radiation source positions in conformity with the angular position of the radiation source,
- weighted integration of the derived measuring values along K lines,
- multiplying all measuring values by a weighting factor which corresponds to the cosine of the cone angle of the ray associated with the relevant measuring value,
- multiplying all measuring values by a weighting factor which corresponds to the reciprocal value of the cosine of the fan angle of the beam associated with the relevant measuring value,
- reconstructing the absorption of each object point by back projection of the measuring values.

2. A computed tomography method as claimed in claim 1, in which in the reconstruction step rebinning of the measuring values is performed prior to the back projection so as to form a number of groups, each group comprising a plurality of planes

which extend parallel to one another and to the axis of rotation and in which a respective fan beam (41 ... 45) is situated.

3. A computed tomography method as claimed in claim 1, in which the integration of the measuring values along K lines comprises the following steps:

- determining a K plane for each radiation source position and each location to be reconstructed in the examination zone,
- determining K lines, that is, lines of intersection between the K planes and a detector surface of the detector unit,
- multiplying the measuring values on each K line by a weighting factor which corresponds to the reciprocal value of the sine of a K angle,
- integrating the measuring values along the K lines.

4. A computer tomograph for carrying out the method claimed in claim 1, comprising:

- a radiation source (S) and a diaphragm arrangement (3) which is situated between the examination zone (13) and the radiation source (S) in order to generate a radiation beam (4) which traverses an examination zone (13) or an object present therein,
- a detector unit (16) which is coupled to the radiation source (S),
- a drive arrangement (2, 5) which serves to displace an object present in the examination zone (13) and the radiation source (S) relative to one another about an axis of rotation (14) and/or parallel to the axis of rotation (14),
- a reconstruction unit (10) for reconstructing the spatial distribution of the absorption within the examination zone from the measuring values acquired by the detector unit (16),
- a control unit (7) for controlling the radiation source (S), the detector unit (16), the drive arrangement (2, 5) and the reconstruction unit (10) in conformity with the steps disclosed in claim 1.

5. A computer program for a control unit (7) for controlling a radiation source (S), a diaphragm arrangement (3), a detector unit (16), a drive arrangement (2, 5) and a reconstruction unit (10) of a computer tomograph so as to execute the steps disclosed in claim 1.